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ORIGINAL ARTICLES.

The Clinical Value of Antiseptics, Both Internal and External.

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Secretary State Board of Health, Pittsburg, Kansas.

GENERAL CONSIDERATIONS.

Antisepsis, a condition not subject to putrefaction; the use of means to that end, and the condition produced by antiseptics.

Sepsis is a condition of a part or system in which a putrefactive process has produced poisoning of the blood, the result of bacterial action.

Asepsis is the opposite of the above condition; or the absence of pathogenic bacterial action; the use of means to that end. Asepsis and antisepsis are very nearly related. The latter may produce the former, or it may produce a condition answering all the practical ends of the former, as far as clinical results are concerned. Asepsis is the ideal condition at which to aim, whether attainable or not; antisepsis is the desirable and attainable condition in medical and surgical practice.

The general term for Sepsis or poisoning of the system from zymotic or bacterial action is septicæmia, which literally means blood-poisoning. This condition or disease (for disease is only a condition) is neither always the same, nor is it a simple condition; nor is it dependent upon a simple process.

Clinically considered, from a surgical point of view, we have septic intoxication, and septic infection. The former is believed to be the [illegible] absorption of toxic material into the circulation, which material has been previously elaborated by micro-organisms acting in a local infected focus of dead tissue. By the presence of such material, ptomaine, the blood is rendered unfit to a greater or less degree for the normal performance of nutrition of the various structures of the body. The dose of the poison may be so great as to overwhelm the system, and thus depress the vital processes to such a degree as to be incompatible with their exercise; hence, life will cease, the victim die. Should, however, the toxic substance be so limited in quantity that the vital powers are able to resist it or the secretions and the excretions dispose of it, and especially if the supply should be arrested recovery will occur, commencing from the moment the introduction of the toxic supply ceases. This condition of poisoned blood is the Sapræmia (rotten blood) of surgical pathology, and its cause is putrefactive fermentation, bacterial action in dead material in such a relation to the fluids of the body as to enable its products to enter into and contaminate them. This condition is accompanied by formation of gas and the odor of putrefaction; and it occurs under conditions of access of air. The emission of fetid odor is characteristic of putrefaction, and belongs to sapræmia; but it may be entirely absent in pure infective sepsis when unaccompanied by putrefaction.

Three conditions are necessary to the production of this condition.

First, dead tissues; second, infection of the dead tissue with putrefactive bacteria; third, a sufficient length of time must have elapsed from the commencement of the putrefactive process to have elaborated a sufficient quantity of toxic material to affect [illegible] (seldom less than twenty-four

hours), and its absorption must have been effected. The dead materials may be any of the tissues or vital fluids of the body, but deprived of their vitality from some cause.

Septic infection may begin in a few hours without any symptom of putrefaction, a most impressive case of which I had in my personal experience following a slight abrasion, or scratch, received during a post-mortem examination, in very cold weather. The local and general symptoms began in less than twelve hours, and ran a violent course extending through several weeks. There was not present the slightest odor of putrefaction, nor was there any formation of gas appreciable during the course of the disease.

The two processes may co-exist, viz: Septic intoxication and septic infection. In that case the symptoms of the two affections will be present, and should be recognized as the result of two separate and distinct causes — all diseases being conditions, whatever may be the special causes.

This suggests, at this point, three essentials in order to the production of those abnormal conditions of the body, which we call disease:

1. An adequate cause.
2. Favorable influences or environments.
3. Suitable material (pabulum, soil) on which to act. These essentials being kept steadily in mind, we will be far better prepared for the prophylaxis, or the treatment of disease; and especially will we be prepared to appreciate antisepsis and antiseptics in both prevention and cure.

In medical, moral and physical abnormalites the first step toward their cure is the discovery of their cause, and then follows its removal or destruction. In a large number of zymotic diseases the essential cause of each has been identified. A few of them may be here tabulated.

It is on the antiseptic and germicidal action of remedies that our hope is very largely based. The causes having been ascertained and removed, their re-occurrence must be prevented.

The second step is to provide surroundings inimical to the development or continuance of the cause or causes. The environments must be rendered utterly hostile to, or incompatible with, the development or even existence of the essential vital causes — the micro-organisms.

The third step has mainly to do with the vital resistance of both part and system — the *vis conservatrix et medicatrix naturae*. Without these preservative powers we would soon all fall a prey to the external antagonisms which are everywhere in operation. Preserve the vital forces, both local and systemic by lessening, to the minimum, the destructive influences, and increasing, to the maximum, the resistant powers — antiseptics (germicides) on the one hand and nutritives on the other.

The germ explanation, a theory of disease, a fact, is no longer capable of successful contradiction. It is not necessary to the proof of this theory or explanation, that every detail of the *modus operandi* of the micro-organisms should be clearly understood, any more than it is necessary to understand exactly how quinine cures ague, before the germ theory in the former, or the remedial fact in the latter, should be accepted.

Three necessary conditions of proof are:

1. The constant presence of a particular germ during the disease; always, or nearly always, found when searched for by competent observers, and under favorable circumstances.

YEAR.	NAME OF DISCOVERER.	DISEASE.	CAUSE.
1873	Obermeier	Relapsing fever	Spirillum (spirochæte) Obermeieri
1877	R. Koch	Anthrax, malig postule, splen fever	Bacillus anthracis.
1878	Neisser	Gonorrhœa	Gonococcus.
1879	Hansen	Leprous tubercle	Bacillus lepræ.
1880	Eberth & Koch	Typhoid fever	Bacil. typhoidæ, B. typhosus—K.
1880	Laveran	Malarial disease	Plasmodium malariæ
1882	R. Koch	Tuberculosis	Bacillus tuberculosis.
1882	Schutz & Lœffler	Glanders	Bacillus mallei.
1883	Fehleisen	Erysipelas	Streptococcus erysipelatis.
1884	Lœffler	Diptheria	Bacillus diphtheriæ.
1884	Nicolaier	Tetanus	Bacillus tetani.
1884	Friedlander	Pneumonia	Micrococus, Diplococcus pneu.
1884	R. Koch	Asiatic cholera	Spirillum choleræ, coma bacillus.
1885	Pfeiffer & Canon	Infl[illegible]	Bacillus influenzæ.

2. Control experiments and cultivation of the same isolated germ.

3. Production of the specific disease by the specific germ by inoculation in individuals otherwise free from the disease.

If an individual should die from poisoning of tobocco it would not be questioned whether he died of the plant or of the nicotine elaborated by the plant. So we apprehend it would be correct to say that a certain individual died of typhoid fever, thereby meaning from the bacillus typhoidæ. not questioning whether the death was caused by the micro-organism itself or from the poison, ptomaine, elaborated by the bacteria. While we do not regard it as quite settled as to how the morbid conditions are effected in septic infection nor in septic intoxication, as there will always be a limit to our knowledge, and though much seems clear as to probability, physiological chemistry has yet some points to establish. Enough, however, is known to indicate the direction in which to apply our preventive measures and remedies.

The great debt of gratitude we of this generation owe to the immortal names of Schwann, Pasteur, Lister and Koch, should be fully acknowledged as well as all praise given to the many who have been working in the same field—bacteriology—demonstrating as fact what could before be known as theory only; proving by actual experiment, and by chemical observation, the inestimable value to the whole human race of antiseptic medicine and surgery. I can now see clearly the wisdom of some of my methods, adopted before Lister began his first work (1867) in this field of dressing wounds antiseptically, and can now understand the reasons for my success.

THE MEANS MADE USE OF, SUBSTANCES APPLIED, AND METHODS ADOPTED, IN ANTISEPTIC MEDICINE AND SURGERY.

The marvelous advances, especially in surgery in the boldness of the operations, and the degree of success in results, can be appreciated by those only who have practiced surgery during a period comprising years previous, as well as subsequent, to the antiseptic era. And we doubt if even they can fully realize the scientific revolution through which they have lived—from a mortality appalling to the wounded, and utterly discouraging to the most experienced operators, the death rate has fallen almost to zero, giving assurance and inspiring hope in the despondent sufferer, and well-grounded courage to his surgical attendant.

From a very large and daily increasing number of substances of greater or less antiseptic power, we give a small list of those, the effective strength of which has been tested by authorities sufficiently reliable to carry weight with their statements, following the U. S. Pharmacopoeia as to their chemical composition; and M. Miquel as to their antiseptic strength. Some others we have omitted, the table being too lengthy.

Boracic acid (H_3 Bo_3 1:143)—Antiseptic, but not strongly germicidal. Bacterium termo is very susceptible to its action. Dose, internally, 10, 15 grs.

Carbolic acid (C_6 H_5 O H)—Antiseptic in 1:333:15 per cent. kills cholera spirillæ in ten minutes; 1 per cent. kills bacillus anthracis in fresh blood in one hour; 1 per cent kills bacillus typhoidæ, spirilla choleræ and the bacteria staphylococcus in two hours. For general surgical purposes use 2 to 5 per cent.

Corrosive Sublimate (Hg Cl_2)—Strongly inhibitory; weaker as a germicide than carbolic acid under ordinary conditions. Little better than "sterilized solution of common salt." Vinegar of 6.3 per cent. to 7.0 per cent ascetic acid strength was just as effectual in inhibitory strength as 1:1000 cor. sub. Efficient strength, 1:20000.

Mercuric Iodide (Hg I_2) 1.55000. Strongly antiseptic (inhibitory), weakly germicidal. Morphia hydrochlorate, 1:13. Antiseptic.

Iodoform (CHI_3)—Probably destructive of the chemical product of the germ action. Used and especially valuable in tubercular diseases. Inhibitory and germicidal by liberating free iodine.

In preparing for an operation absolute cleanliness should be the aim from beginning to ending, especially so should it be a non-suppurating case that requires the

operation. A general bath, unless there be some valid objection, we have always recommended, with free use of soap. The field of operation (including parts to a considerable distance around) should be well scrubbed with soap and water; washed with sterilized water; then alcohol or ether applied; again washed with carbolic acid soloution, 2.5 per cent. to 5 per cent., or with corrosive sublimate solution 1-500 or 1-1000, as the case may seem to require. It is well, if time permit, to cover the immediate field of operation with a compress of antiseptic, either carbolic acid, 1:40, or corrosive sublimate, 1-1000. These preparations having been properly made, the parts should be in fit condition for the operation.

It would seem superfluous at this day, in any directions short of a treatise on antiseptics, to describe in detail the method of cleansing the hands, the vessels to be used, the sponges or mops, the instruments, the dressings, etc., etc., when we insist that everything used and surrounding the patient should be scrupulously clean, aseptic.

As to the *method* of *dressing:* Whatever is used should be antiseptic--sterilized before being applied. All bleeding from the wound should be arrested by ligature, tortion or hot water. "Tie everything," said Prof. Sands, meaning thereby all arteries and veins. Arrest oozing, as far as may be, but provide for the ready escape or absorption of fluids, especially in all large operations. Whatever else may be done, do not fail to provide against the accumulation of fluids around the end of the bone, in amputations, as may occur during the first twenty-four or thirty-six hours. If the dressings become moistened through, or any odor is perceptible, with local pain, or if there is fever at the end of the first twenty-four or thirty hours, the dressing should be carefully examined or removed. As a general proposition, dry dressings are to be preferred in aseptic, non-suppurative operations. To show what cleanliness could accomplish before Lister's reformation, I will give some of my actual experience, to illustrate free drainage, dry dressing, and open-wound treatment: Under my observation and care were, at one time, in one inclosure (ward) eighteen cases of amputation of the thigh and leg. There was positively not a case of the eighteen in which there was any indication of putrefaction of pus, so far as could be inferred, or from any effect upon any one of the patients. The flaps were left open in the middle from the end of the bone out, and drainage secured by inserting a piece of bandage, thus preventing the adhesion of the flaps in the middle, and securing free drainage for the first day or two. After the first dressing, no water was used on the wound. Lather was used to clean the integument of any dried pus. A large sponge was so placed in contact with the limb as to absorb all fluid (pus or serum) that might come from the wound; and it was removed every half hour or hour, washed, scalded and replaced. Result: Every case recovered. Contrast that with what I saw before, and what I saw in Europe afterwards, during my observations on amputations and in collecting statistics. Suppuration producing pus by the ounce or pint, putrefactive intoxication, septic infection, emaciation, exhaustion, death! Mortality appalling!

I had at one time two cases of amputation of the thigh in the month of July, one in the upper third (at the trochanter minor), the other in the lower third (or at the junction of lower and middle thirds.) They were dressed as above indicated; a cloth was wet with spirits of turpentine and folded loosely around the stumps to keep the flies away, it being midsummer. The cleansing was done mostly dry; no washing of the cut surface after the first dressing. I attended the cases myself, and was rewarded by seeing both recover without an untoward symptom, contrary to all unfavorable predictions. I had come to believe that, under ordinarily favorable circumstances, if the patient did not die from shock within thirty-six hours, he should recover.

Now antiseptic treatment does not surpass that experience so much in final re-

sults. But it is expected that the union will be without suppuration in the large majority of cases. That of course is far better in every way. For all solutions of continuity of tissues, soft or hard, antisepsis by the use of inhibitory or germicidal means, is a most marvelous advance; and it has, as a method of treatment, become established and obligatory. Traumatisms, whether from operation or from any other cause, should be treated antiseptically; with dry or moist dressing, according to the nature and demand of the case. Irrigation may be needed as in a case of retained portion of placenta; or in an open, soiled, compound fracture. The same is true of a purulent ophthalmia, whether it be dependent upon Neisser's micro-coccus or upon any other cause; or in a case of otitis media suppurativa, the same principle applies. The poison must be destroyed as far as possible, and what remains must be weakened by dilution as far as may be. For this purpose acetate of aluminum is a most excellent antiseptic, one that I began using in 1873 in gonorrhœal ophthalmia, with most gratifying results; as I did also in leucorrhœa of pregnant cases in which there were much irritation and scalding of the external parts. Its effects in the latter cases were signal. Its efficient strength, you will observe, is placed at 1:6310. I have used it, as a wash, in a strength of a drachm to a pint of water, and as a vaginal injection about the same or less. In cases unsuitable for dry dressing, irrigation, with a view of dilution, must be kept in mind whether the fluid used be sterilized water, or a fluid holding in solution some more or less active antiseptic or germicide. But an important factor in the favorable result will be the weakening effect of dilution on the obnoxious substance. This was the secret of my success in the ante-Listerian period (1867). And as we can never be quite sure that there may not be left lingering, in or about the part, more of the injurious germs than may be disposed of by the vital action of the part or system, the number of the pathogenic microbes should be reduced to the minimum; "250,000,000 are necessary to produce circumscribed abscess."

An antiseptic that is at once germicidal and yet not injurious to the vitality of the tissues to which it is applied, nor to the system, is most desirable and, we believe, is to be had by a judicious combination of vegetable and mineral (organic and inorganic) substances. Some such combinations have reached a very high degree of antiseptic *Efficient Strength.*

From the surgical to the medical clinic we must now turn our attention. After the pathogenic germ enters the tissues and the circulation, and has fairly entered upon its zymotic-fermentative, bacterial process, as Bilroth once said, "It is a wonder that it ever stops. One bacillus may multiply to sixteen and one-half million in twenty-four hours." We know, as a matter of fact, that this process may, and in many cases does, terminate short of the death of the patient; and in some of its forms leaves the patient protected, immune, for a greater or less period of time. The office of clinical antiseptics is to counteract the poisons (ptomaines, lucomaines) either within the circulation, or within the various tracts of the body—the respiratory, the gastro-intestinal, or the genito-urinary tracts. In the respiratory tract antiseptic sprays and inhalants may be of great service in antagonizing fetor of the breath, in cleansing the mouth, throat and nasal passages, and especially is this true in reference to parts accessible to washes and gargles in low fevers. Cleansing the nasal passages with antiseptics is the basis of all local, successful treatment of nasal catarrh. In this disease, especially in the chronic form, an alkaline solution, with carbolic acid added, to cleanse the parts, followed by liquid petroleum holding in solution ten or fifteen grains each of camphor and menthol (previously liquified) is one of many means of similar kind of giving great relief.

In the gastro-intestinal tract we use emetics, or antidotal remedies: Emetics to remove deleterious substances already elaborated; to remove materials suitable for putrefactive-bacterial-action; antiseptics to inhibit, arrest, or destroy the causes of

deleterious action. These in their order may be: Mustard and salt in warm water, ipecac, sulphate of zinc, sulphate of copper, yellow sub-sulphate of mercury (turpeth mineral in croup), apomorphia (sub-cutaneously), emeto-cathartic of ipecac and calomel, or small repeated doses of calomel or corrosive sublimate; or combinations of antiseptics, sub-nitrate of bismuth, resorcin, citric acid, carbolic acid and iodine; cathartics, (under whose action the number of bacteria are remarkably decreased in the fæces), turpentine with castor oil or in emulsion (in typhoid fever), nitrate of silver in one sixth to one-fourth grain doses. extract of malt (in tympanitic condition of bowels in typhoid fever), copious enemata to wash out the bowels, using either sterilized water, or tannic acid in 2 per cent. solution in large quantity (in cholera, the acid having an antiseptic strength of 1:207), injections of nitrate of silver being very useful in some epidemics of dysentery.

In the genito-urinary tract the antiseptic action of drugs on the urine and on the mucous surfaces has been shown to be very beneficial in medical cases, and likewise so in preparing the parts for surgical operation. Boracic acid (antiseptic power 1:143), benzoic acid (antiseptic power 1:907), benzoate of soda, quinine, and hyposulphite of soda, acting upon the urine in preventing decomposition and bacterial action, are of prime importance in many diseases affecting this system (tract), in fact most of the cases of inoculable diseases affecting these parts are treated by the use of diuretics which depend to a large extent for their remedial properties upon antiseptic action; and the same explanation is applicable to the local measures usually employed.

As to particular drugs and their doses, the general practitioner will be governed by the well-established facts in medicine; but this confidence will be greatly strengthened, and his resources multiplied, by having become informed of the approximately exact relative *efficient strength* of the drugs he is using. The increased efficiency obtained by combining them should be steadily borne in mind One substance may have a higher inhibitory or destructive power over one micro-organism than another drug may have, and yet the second may exceed the first in its power over another genus or species of these growths. Therefore, a correctly combined compound preparation will furnish a higher relative power than the simple one.

When the infectious germs have not only reached the circulation, but have located themselves at some one point or at many points it may be, and, added to that, toxic pre-formed material also is circulating in the blood, the case has, indeed, become alarming. If there is any local focus of septic bacterial acti n accessible it must be arrested. The germicidal and recuperative powers of the general system must be supported and strengthened in every possible way. In such an apparently desperate case, the vital, restorative powers are our main hope; and in multitudes of instances it is not a vain hope. In a vast majority of diseases which run a definite course the tendency is to recovery by the pabulum on which the specfiic germ subsists becoming exhausted, or by its own production arresting its action, as in the case of acetic fermentation, or as in the extinguishing of flame by carbonic acid, its own production, or by some other mode yet undiscovered. The morbid processes cease, the pathological changes gradually disappear, nutrition gains the ascendancy, the depressed vital powers revive and reassert their supremacy, the patient recovers. And all this is accomplished by natural and artificial *antisepsis* and *antiseptics!*

DR. C. J. TUCKER formerly of Meriden, Kas., is now located at Holton, Kas.

THE Kansas Medical College opened last Tuesday with an enrollment of forty-eight students. The prospect is a very bright one, and in all probability more than one hundred will be enrolled during the next two weeks.

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Topeka, Kansas, Saturday, Sept. 18, 1897.

WHEN we speak of the science of medicine, we mean an explanation of the nature of diseases and their remedies as now understood. We do not mean that medicine is ever an exact knowledge, but an approximation to it. Through research and investigation we are from time to time approaching nearer to facts. Future investigation will bring out new ideas or modify some of our present ones through the application of higher tests than are now at our command. Medicine will be regarded as a science though never as an exact knowledge, and the term science of medicine will never be more appropriate than it is at the present time, though our present ideas and teaching of the subject may be relegated to the past as worthless and useless as have been the teachings of the illustrious fathers of medicine.

WE call attention to the advertisement of Bonner Springs Lodge, a sanitarium for the treatment of nervous diseases, under the management of Dr. M. P. Sexton, who is recognized throughout the West as a competent neurologist. The building is large and commodious, and every facility provided for the comfort and care of patients. The doctor reports some excellent results in the treatment of inebriety, and it would seem that physicians all over the country would much prefer such an institution as this to the much advertised Keely Institutes.

THE treatment of cardiac diseases by the Schott method is receiving some attention at the Johns Hopkins University. The principle of the treatment is to relieve the heart of its work by keeping the blood in the superficial vessels, also by slight physical exercise of the patient, and is done by bathing systematically with varied solutions of sodium chloride, calcium chloride, bicarbonate of soda and hydrochloric acid. The bath is given when the stomach is empty, and the patient makes as little exertion as possible.

RECTOSCOPY—A Dutchman has invented a rectoscope. By it, photographs of the rectum can be taken as far up as the flexura sigmoidea. This will facilitate the diagnosis of rectal diseases, and make the rectum as it were an open book.

DR. H. Z. GILL, secretary of the State Board of Health, has been appointed surgeon general for the Grand Army day at the Fall Festival.

Consumptives in Colorado.

The International Journal of Surgery.

The *Denver Medical Times* contains an able and timely editorial by Dr. T. H. Hawkins, from which we quote as follows:

"The majority of the physicians of Colorado are adverse to the publication of any report that would in any way discourage

consumptives from coming to Colorado or injure the state as a health resort for consumptives. Personally, we believe that it would be a good thing to promulgate the true facts in the case, both in the interest of those living in Colorado and of those contemplating coming to Colorado. No special good, as far as the future is concerned, can possibly follow from filling up this beautiful country of ours with consumptives. For the present it might increase our census, but in the end it will ruin our state and deplete our population. Certainly it is not a pleasant thing to look forward to the time when the inhabitants of Colorado may be pointed out as a race of consumptives, or at least descendants of consumptives.

Patients in the third stage of consumption are rarely benefited by our climate, and with few exceptions, their removal to Colorado should be discouraged. Cases of incipient tuberculosis are, as a rule, greatly benefited and many of them cured. This is one of the grandest states in the Union; it is, unquestionably richer than any other state in natural resources, aside from its magnificent climate, and why should we cater to the invalid class, particularly consumptives? On the contrary, we believe that we should encourage strong, healthy and able-bodied men and women to come into this country and help to develop it, that we may have not only a grand and glorious commonwealth, but that we may have a happy, wise and robust citizenry of men and women. We cannot expect a happy and prosperous race in the descendants of tuberculous patients.

We believe, with Dr. Munn, that if consumption is on the increase in Colorado, Eastern people should know it, and, especially, we should be cognizant of it ourselves. And consumption is on the increase —first, because of the greater number of consumptives coming to our climate; second, because of the greater number of children born of consumptive parents; third, because of the saturation of our soil and atmosphere with tuberculous infection. We verily believe that unless something is done to prevent consumptives, especially those in the advanced stages, from congregating in Colorado, and to limit the birth of consumptive offspring, and to guard the people from infection, Colorado will become a pest-hole, a most thoroughly undesirable place of abode.

If we must have consumptives in our state, let us pass laws and regulations that will not only be of service to the consumptive himself, but will also protect those who have been so blessed as to not have the disease. It can certainly do our tuberculous patients no harm, but rather very great good, to adopt the most rigid health laws and measures for preventing infection."

Colorado is one of the brightest and most favored spots in America; still the future outlook for residents of that state is not so bright as it might be.

No one would be allowed to cross the line and enter the state of Colorado with a herd of tuberculous stock. There is legislation on this point, and it is right. With Dr. Hawkins, we believe in legislation and the adoption of rigid health laws.

The healthy citizen of Colorado must protect themselves and prevent infection, but they have a mighty work to do.

They have a question before them as high as Pike's Peak, and, perhaps, more difficult to get over. We have faith to believe, however, that a way will be found to remove or diminish this danger to Colorado's people.

We suggest legislation, State inspection, colonization at different altitudes to suit individual cases, and measures for *destroying all tubercle bacilli.*

We say to the medical men of Colorado, if you wish good work done, do it yourselves. Set about the work at once. Perhaps the meeting of the American Medical Association will aid in the good work.

DR. L. C. DUNCAN, professor of anatomy of the Kansas Medical College, has recently married and located at Meriden, Kas.

Prevention of Typhoid Fever.

(Common continued fever; enteric fever ileo-typhus; mountain fever.)

The following letter has been sent out by the Secretary of the State Board of Health:

Office Secretary of State Board of Health, Topeka, Kas., August 30, 1897—This form of fever is recognized as occuring in almost every country and latitude on the globe. It is admitted to be endemic in the United States.

Where intermittent and remittent (autumnal) fevers had extensively prevailed in our new countries, as cultivation became more general, so, in inverse proportion, these forms diminished in prevalence and in intensity. But typhoid (continued) fever came to take the place of the other forms, in the new, wooded countries, especially, and it has become a dreaded disease, producing a fearful aggregate of mortality.

Table 1.

	1890	1891	1892	1893	1894	1895	Av.
New York	21	22	22	20	17	17	20
London	16	15	11	16	15	14	14.5
Berlin	9	10	8	9	4	5	7.5
Hamburg	23	23	34	18*	6	9	7.5
Rotterdam	8	4	6	5	4.8	2	4.6

*Filters started, May, 1893.

The above table of typhoid-fever death rate per 100,000 of population, living in the above-named cities, tells its own story—whether typhoid fever is a preventable disease.—*John W. Hill, C. E., in Sanitarian, June, 1897.*

The cities of Berlin and Chicago are nearly alike in population, but they are very unlike in their typhoid-fever death rates, as is shown by the following table far the past five years:

Table 2.

	1890	1891	1892	1893	1894	Av.
Berlin	9	10	8	9	4	8
Chicago	83	160	104	42	31	84

That is, the average death-rate from typhoid fever in Chicago for the five years mentioned, was nearly ten and a half (10.5) times that of Berlin. Do the people of Kansas and Chicago think more of money than of human life? These figures might be extended almost without limit, but all yielding the same results. Was that fearful loss of life in only one great American city, and the amount of sickness besides, from a disease largely preventable—was it suicide, criminal neglect, ignorance, or murder? or was it Providence? To answer in the affirmative as to the latter cause would be little less than blasphemy, and would tend to show that He valued a German life above an American.

In order to the prevention of any disease a knowledge of the cause is at least important.

It is believed, upon reliable and increasing evidence, that typhoid fever has its peculiar germ, just as many other diseases are known to have theirs, viz., the bacillus typhoidæ (b. typhosus, *Klebs*); and that it is quite tenacious of vitality. Repeated freezing does not kill it. Of course there is a limit to its vitality, both in reference to time and surroundings; but freezing has a tendency to preserve rather than to destroy it; just the contrary of what many people may suppose, and as is the case with many other germs. This fact should be borne in mind when disposing of the discharges and soiled clothing of those sick of this disease.

In malarial districts the disease may be complicated in such manner as to give various forms, but still it may be, in its dominant features, typhoid fever. The great majority of cases of continued fever in Kansas are quite different, in some respects at least, from the typical typhoid of Ohio, Indiana and Illinois of 25 to 40 years ago.

The source of the media of infection or contagion (both methods are alleged to exist) are numerous; but first, and most important for our present condideration, *is the water-supply.*

That a large proportion of the annual number of cases of this very dangerous disease—the mortality in hospitals ranging from 10 per cent. to 25 per cent. of the number of cases—not only *can be prevented* as a matter of theory, but has been as a *historical fact.* This, too, on such a large scale as to leave no doubt; and by the purification of one source only, to wit, the water-

supply. Kansas City is now contemplating the right thing — public filters.

It is a cause for at least some hope, that as the facts of science are brought to the attention of the public in such a manner as to be demonstrable, some at least, may we not say many, are coming to an appreciation and application of the facts greatly to their benefit, in preventing sickness and death in their families from this one disease.

In the cities, the purity of the water supplied to the public should be of first importance. That having been secured beyond any question, the next consideration is as to the wells, cisterns, etc. The health officers of the cities should make themselves thoroughly acquainted with the quality of water from such sources of supply. If this is not known before a single case occurs, that one should be sufficient to start a thorough investigation in this line of search especially, as well as in others. The attention of the public should be frequently called, through the public press, by the local health officer, to the very great danger to health from this source. It must be "line upon line," warning after warning.

If the water-supply is not up to the standard of purity (the German government has a standard for water, "German Imperial Standard of Hygiene," as our cities have a standard for milk), the defect should be at once removed, or the water company should be proceeded against by law; for every community is entitled to wholesome food or drink when it is paid for.

Unwholesome, disease-producing water, whether from public or private supply, should be declared a nuisance and abated, and its use forbidden.

This method is being adopted in all large cities, greatly to the benefit of health and lowering of the average of sickness and mortality.

Dilution is one of the methods of rendering most poisons organic or inorganic, less active—indeed, it may render them inactive; but the great destructive agent of all disease-producing germs is *heat*. This agent, when combined with moisture and applied for considerable length of time, will destroy the vitality of both the plant and seed (germ and spore). *Boiling* is a common and convenient method of purifying drinking water.

If the farmers, who depend on water from wells, springs and cisterens, would boil all the drinking and cooking water during dry seasons in the summer and fall months, when the water is low, hundreds of families would be spared long spells of sickness, and, in many cases, death from this dreaded, yet in large measure, *preventable disease*. The lowest water level and highest mortality from typhoid fever are coincident in October.

The contamination of the water may occur from a saturated soil, such as "made ground;" or, following the stratum of stone, from a neigboring privy; or from the dejections of a typhoid case being thrown on the snow in winter or on the ground in summer, and thence being washed into a spring or stream from which water is used. Terrible outbreaks of most fatal character have been caused by the last-mentioned practice, done in ignorance, but followed by no less fatal consequences.

There are many other sources of infection, some of which we can only mention:

Soiled clothing of the sick with typhoid. Laundresses are more likely to be infected than nurses of the hospital.

The sputa in a case accompanied by pneumonia or bronchitis may poison the air of a sick-room; or an ill-ventilated room or ward, in which one or more cases may be confined, it is believed can be so contaminated by concentration of the poison as to affect attendants or other patients.

Milk is not an uncommon medium by which the disease is spread.

We believe it possible for the disease to arise spontaneously, that is, without any known cause, as in the opening of some old well or cess-pool into which filth of whatever kind has been thrown and allowed to accumulate. But this may not be, in strict sense, an example of the disease arising *de novo*.

The origin is not always ascertainable, any more so than it is in many other infectious diseases.

There are a few well-authenticated cases of infection from diseased meat, the animal having been known to be in an unhealthy condition when slaughtered.

The health officers of the State will please give this circular all possible circulation by publishing in the county papers.

E. M. HOOVER, M.D., *President.*
H. Z. GILL, M.D., *Secretary.*

Strophanthus—A Clinical Study.

American Medico-Surgical Bulletin.

A paper, based upon a clinical study of this drug was read before the Medical Society of the State of New York, at Albany, Jan. 27, 1897, by Dr. Reynold W. Wilcox (*American Journal Medical Scienee*).

In the observations cited use was made of a 5-per-cent. tincture prepared according to the United States Pharmacopœia from strophanthus (Kombe). In order to eliminate errors of pharmaceutical manipulation the author employs the tincture of strophanthus (Kombe) made especially for him by Parke, Davis & Company. Many of the patients experimented upon had been treated, some for many years, with digatilis and similar drugs, and all presented lesions giving rise to symptoms of marked severity.

Its therapeutic field of usefulness can be ascertained from the following facts:

1. It acts directly upon cardial muscle (Fraser, Yeo, Biddle, Potter).

2. It has little or no influence upon the calibre of the blood vessels (Fraser, Delsaux, Yeo).

3. It acts but temporarily upon the innervation of the heart (Hayem), if at all.

4. It is diuretic (Fraser, Delsaux, Porteous) in certain cases (Yeo), particularly those in which the previously existing blood-pressure is low (Budd).

5. It is a bitter stomachic (White), and in moderate doses does not disturb digestion (Budd), and it relaxes the bowels (Porteous).

6. It is antypiretic (Potter, Rovighi, but denied by Martin) within limited range, because under its administration the consumption of oxygen is smaller and the processes of combustion are depressed (Bartholow).

7. Since its active principle is soluble in less than its own weight of water, it possesses the diffusibility of a soluble crystalloid (Fraser), hence the prompt results from its administration; its active principle escapes with the urine (Wood), so that we have already elimination (Butler), although somewhat slower than its absorption, and therefore an overlaping of effect from too frequently repeated doses (Bartholow).

8. Habit does not seem to impair the therapeutic usefulness of the drug (Farquarharson).

The therapeutic indications are, then:

1. Rapidly recurring cardiac systoles of lessened force and irregular rhythm. We get then, first, a more vigorous contraction of the ventricle, with a slowing of the pulse-rate and consequently a lengthening of the distole, which is the period of rest for the heart; next comes the disappearance of irregularity of rhythm; and lastly, from improved intracardiac nutrition, a permanent strengthening of the heart-muscles.

2. The absence of vasomotor effects enables us to use this remedy in those instances of permanent high tension which are met with in some forms of Bright's disease, in arterio-sclerosis, and in the rigid arteries of the aged.

3. Whenever diuresis can be promoted by increased blood-tension resulting from more vigorous cardiac contractions this may be expected from the use of this remedy.

4. The rapidly appearing effects of its administration, together with its regular elimination, make it the drug of choice when the symptoms are urgent.

5. The absence of digestive disturbances from therapeutic doses and slight likelihood of habituation to its administration make it important when long-continued use is necessary.

The instances in which failure will follow its administration are those of:

1. Advanced degeneration of the myocardium (Fraser, Quinlan).

2. Extreme mechanical obstruction to the circulation from valvular incompetency or obstruction.

3. A combination of these.

In the fully compensated heart this—as well as other drugs of the same type is unnecessary, and when over-compensation exists it will likely aggravate the condition. The writer is in accord with Hare in acklowledging its great value in the cardiac diseases of children. In addition, in corpulent individuals we obtain most excellent results. Of special importance we should consider its administration for the weak hearts of anemia and chlorosis.

In general, the author states that within an hour the pulse visibly strengthened, the line of ascension, from being nearly horizontal, approached the vertical, the line of descent suddenly fell, the dicrotic wave disappeared, and the irregularities and inequalities were almost always overcome.

Nor is this a temorary effect, as is shown by the permanence of the results upon continuation of the same or lessened dose.

After citing, in detail, twelve observations, the writer goes on to consider the advantages which strophanthus possesses over digitalis, which are summed up thus:

1. Greater rapidity, modifying pulse-rate within an hour (Potter).
2. Absence of vaso-constrictor effects.
3. Greater diuretic power.
4. No disturbance of digestion.
5. Absence of cumulation.
6. Greater value in children.
7. Greater safety in the aged.

The administration of strophanthus requires:

1. An active, well-made preparation from a reliable source.

2. Avoidance of its use in fully or over-compensated hearts, in those which present advanced muscular degeneration or mechanical defects of high degree.

3. The use of not too large or too frequently repeated doses. The dose of five drops of a reliable tincture three or possibly four times a day is sufficient.

Strophanthus is the drug of choice in:

1. All cases in which we wish to establish compensation.

2. All cases of arterial degeneration in which a remedy which causes more energetic cardiac contractions is required.

3. All cases of cardiac disease where diuresis is necessary.

4. All cases of weak or irritable hearts.

5. All cases of cardiac disease in childhood or old age.

English Comments on the Congress.

Medical Record.

The correspondents of the English journals are not extravagant in their praise of the Moscow congress. As is usual at such gatherings, absolutely no provision was made to facilitate the work of the reporters for the medical press. The correspondent of the *Brilish Medical Journal* writes, in relation to this: "In a country where practically a press is non-existent, it would be perhaps ridiculous to expect that the convenience of the members of the press of other countries should be carefully considered; but whether it was expected or not, it certainly has been most studiously neglected. The bureau is such only in name; in it one finds neither information nor officials, nor anything, indeed, more than tables, pen and ink. It rests, therefore, with the individual correspondent to seek such information as can be gleaned from overworked secretaries and personal observation." Our own correspondents have told us the same story, and the complete and accurate reports which they have sent us were obtained only by following each speaker and taking down his words af they were spoken. The officials of the congress gave them no assistance whatever. *The Lancet* representative complains of the lack of toilet conveniences, "of the shameful inadequacy" of which, he writes, "a plain word must be spoken. One urinal and one water-closet were placed at the disposal of the whole congress, and both were in the same little wooden hut, divided from each other by no partition. Moscow is, according to European ideas, very inadequately supplied with latrines, while the unblushing publicity of the East concerning the performance of all the offices of nature to a great

extent prevails; but those responsible for the arrangements of the public meeting in the Manege ought to have remembered that the meeting was an international one, and not an Oriental one." Finally, the *Medical Press* says that the Russian government excluded Jewish physicians from the congress—a fact, if it is a fact, which greatly surprises us, for it had been declared officially that no distinction would be made against Hebrews on this occasion. "Naturally enough," our contemporary says, "much irritation has been caused by the exclusion of Jews from the Moscow congress. An incident in connection therewith has been referred to by the Moscow correspondent of the *Standard*. At one of the dinners held in honor of the congress, a heated discussion took place across the table between a Russian member and one of the best-known German professors, *apropos* of the prohibition, in the course of which the former used threatening gestures toward his *confrere*, who was an elderly man. It was only after considerable difficulty that an adjustment of the quarrel was brought about. Such asperities, of course, should have no place at the meetings of scientific men. But neither should any narrow-minded exhibition of religious or racial intolerance be permitted by those responsible for the organization of the *reunions*."

Future Development of Mind.

Medical Record.

The second corollary, which is even more important than the first, is that, upon the view here set forth, the human mind at present is not formed, but forming; is not completed, but in process of construction. By slow and dubious steps taken in darkness our remote ancestors wearily climbed to simple consciousness. After another immense interval they reached self-consciousness. But that cannot be the end—the cosmic process cannot stop there—cannot, indeed, stop anywhere. Evolution, as far as we can see, has always gone on, is going on today, and will always go on. Our old mental faculties are some of them fading out, others advancing toward greater perfection, and alongside of them new ones are springing up, some of which will, without doubt, be of overshadowing importance in the future.

So-called telepathy and clairvoyance seem to be specimens of such nascent faculties. I place in the same class the phenomena of what is often named spiritualism. The labors of the Society for Psychical Research have made it to me plain that these phenomena, as notably in the case of W. Stainton Moses, really exist. And I think that a study of the above-mentioned case, together with that of Mrs. Piper and that of Mary J. Fancher, of Brooklyn, would compel any unprejudiced person to make the same admission. But to me these are not cases in which outside agents are acting on or through a human being, but are cases in which a given human being has faculties which are not commonly possessed. Whether any given faculty, such as one of those now alluded to, shall grow, become common, and finally universal in the race, or wither and disappear, will depend upon the general laws of natural selection, and upon whether the possession of the nascent faculty is advantageous or not to the individual and to the race.

But of infinitely more importance than telepathy and so-called spiritualism, (no matter what explanation we give of these, or what their future is destined to be) is the final fact to be here touched upon. This is that superimposed upon self-consciousness, as is that faculty upon simple consciousness, a third and higher form of consciousness is at present making its appearance in our race. This higher form of consciousness when it appears, occurs, as it must, at the full maturity of the individual, at about the age of thirty-five, but almost always between the ages of thirty and forty. There have been occasional cases of it for the last two thousand years, and it is becoming more and more common. In fact, in all respects, as far as observed, it obeys the laws to which every nascent faculty is subject. [illegible] less perfect exam[illegible]

new faculty exist in the world today, and it has been my privilege to know personally, and to have had the opportunity of studying, several men and women who have possessed it. In the course of a few more millenniumi there should be born from the present human race a higher type of man possessing this higher consciousness. This new race, as it may well be called, would occupy, as toward us, a position such as that occupied by us toward the simple conscious *alalus homo.* The advent of this higher, better, and happier race would amply justify the long agony of its birth through the countless ages of our past. And it is the first article of my belief, some of the grounds of which I have endeavored to lay before you, that a race is in course of evolution.

Tincture of Cantharides in Infectious Nephritis.

Antoinette Myszynska (*N. Y. Med. Jour.*, No. 962, p. 647) gives an account of experiments with tincture of cantharides in the treatment of ten cases of epithelial nephritis. It was administered in doses of from six to eleven drops in a glass of milk. The patients were first put upon a milk diet, then on the ordinary diet of the hospital, a condition which conduced to a better appreciation of the effects of the tincture on diuresis and on albuminuria. The results were as follows: Rapid and complete recovery from a persistent albuminuria occurred in a malarial subject; recovery from an excessive albuminuria that had resisted all other treatment for seventeen months, in a tuberculous subject, with improvement in the general condition and fibrous cicatrization of the lesions of the third degree; improvement in three cases, that was interrupted by the departure of the patients against the advice of the physician; and, finally, negative results in five cases.

In eight of the ten cases (all but those of lead-poisoning) the tincture of cantharides manifestly and rapidly increased the amount of the urine, and this increase persisted after the cessation of the drug and the suppression of milk in the patient's diet.

A new point observed was that, the tincture being administered in all cases at first with the absolute milk diet and afterward with a mixed diet, the proportion of albumin decreased in spite of the suppression of the milk, and diuresis remained abundant.

Without exception, a marked increase of appetite was observed in the patients. In one case the drug seemed to have a peculiarly salutary and unexpected influence on the general condition of the patient.

The writer concludes that, as the tincture of cantharides is a remarkable diuretic and a valuable means of decreasing the degree of albuminuria in young subjects suffering from epithelial nephritis, it will be useful to continue its employment in similar cases, in doses of from four to twelve drops in a glass of milk; its use should, however, be suspended on the least symptom of intolerance, and resumed after a time in progressive doses.

M. Du Cazal, says the writer, insists particularly upon the necessity of repeated doses of the tincture after short intervals of rest, if the drug has not shown itself efficacious the first time, and he cites favorable instances in support of this statement.

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